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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/657,386	09/08/2000	Toshiaki Yoshihara	1100.64726	3309
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GREER, BURNS & CRAIN
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CHICAGO, IL 60606

EXAMINER

AKKAPEDDI, PRASAD R

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 12/17/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/657,386

Applicant(s)

YOSHIHARA ET AL.

Examiner

Prasad R Akkapeddi

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☒ Interview Summary (PTO-413) Paper No(s) 7.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention: The term "Maximum" is not properly defined in the specification. On Page 7, lines 7-8, Q is defined only 'as a quantity of charges that is injected into the liquid crystal display element'. So, maximum quantity of charge is not defined.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by JP-5-34724 (identified as Ref. 1 from hereon).

As to claim 1: Ref. 1 discloses a liquid crystal display with a pair of substrates (13,4) with a liquid crystal (3) there between having a spontaneous polarization (Abstract) and an electrode (12) corresponding to a pixel (Fig.1) and a switching element (TFT) that are placed on an inner surface of one of the

substrates (4), the switching element to drive the liquid crystal corresponding to a pixel when turned on, and in the abstract discloses that the electric charge stored in all capacitances (maximum charge) is more than two times as much as the product of spontaneous polarization and an area of the pixel electrode (i.e., $Q > 2Ps$). Hence the spontaneous polarization of the liquid crystal is a magnitude of not more than 1/2 of a maximum quantity of charge that is injected to the liquid crystal display element corresponding to a pixel when the switching element is turned on.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2,5-6, 9-10 and 13-14: are rejected under 35 U.S.C. 103(a) as being unpatentable over Ref. 1 in view of Kodon et al (Kodon) (U.S.Patent No. 5,465,168).

Although Ref. 1 discloses a liquid crystal display device having spontaneous polarization at 1/2 the charge of a conventional device, Ref. 1 does not disclose the relationship of dielectric constant to various liquid crystal materials having different spontaneous polarization values. However, in (Col 12, lines 28-63) Kodon for ferroelectric type liquid crystal devices, discloses in great detail the relationship between dielectric constant and spontaneous polarization and the requirement of keeping the dielectric constant at a low value. Kodon

also discloses several compositions of liquid crystal material that are commercially available, with varying degrees of spontaneous polarization. Kodon also discloses that several other compositions of liquid crystals may be mixed together (Col 11, line 35-37). So, it is fairly obvious to mix liquid crystal materials having the spontaneous polarization values (15 nC/cm², 10nC/cm² and 7nC/cm²) and with a dielectric constant of not less than 3. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt different compositions of ferroelectric liquid crystal materials disclosed by Kodon to the liquid crystal display disclosed by Ref. 1, because these devices will enable large angle viewing by better matching the polarity of spontaneous polarization of the liquid crystals with that of an electric field.

3. Claims 3, 7, 11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ref. 1 in view of Okada et al. (Okada) (U.S.Patent No. 6,177,968).

Ref.1 does not disclose color filters for the three primary colors to carry out a color display. Okada on the other hand, in disclosing a similar ferroelectric liquid crystal display having spontaneous polarization equal to $\frac{1}{2}$ of a maximum quantity of charge, discloses color filters (13) of the three primary colors, red (13a), green (13b) and blue (13c). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt different color filters as disclosed by Okada to the liquid crystal display disclosed by Ref. 1, because these filters will enable a color display device.

4. Claims 4, 8, 12 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ref. 1 in view of Iba et al. (Iba) (U.S. Patent No. 6,456,266).

Ref.1 does not disclose a back light emitting three primary colors and the synchronization of these primary colors to carry out a color display. Iba on the other hand, in disclosing a similar liquid crystal display of the ferroelectric type (Col. 8, line 25) discloses the three primary colors (Col. 8, lines 52-65) R, G and B and the associated drive circuit and the ON/Off times and the synchronization necessary to carry out a color display. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt three primary colors and the synchronization with the switching element as disclosed by Iba to the liquid crystal display disclosed by Ref. 1, because this will enable a color display device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prasad R Akkapeddi whose telephone number is 703-305-4767. The examiner can normally be reached on 7:00AM to 5:30PM M-Th.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on 703-305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0530.

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Art Unit: 2871

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December 6, 2002


ROBERT H. KIM
SUPERVISORY PATENT EXAMINER
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